

REMARKS

Applicant thanks the Examiner for a thorough search of the present application, but respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow. At the time of the outstanding Office Action, claims 1-20 were pending. Of these claims, claims 2, 7 and 12 have been canceled and claims 1, 6, and 11 have been amended. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier. Thus, claims 1, 3-6, 8-11, and 13-20 are now pending for examination in this application.

In the outstanding Office Action, claims 1-16, 18 and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 6,349,217 to Honcharenko et al. (“Honcharenko”) in view of U.S. Patent No. Ishikawa et al. (“Ishikawa”). Although Applicant does not agree with this rejection (as discussed in Applicant’s previous correspondences), in a good faith effort to advance prosecution of the present application, Applicant has further amended independent claims 1, 6, and 11 to more particularly describe aspects of the present application. In particular, Applicant has incorporated into independent claims 1, 6, and 11 features substantially similar to those previously presented in dependent claims 2, 7, and 12. Applicant respectfully submits that neither Honcharenko nor Ishikawa, whether considered alone or in combination, teaches or suggests the features recited in claims 1, 6, and 11, as amended.

Independent claim 1, as amended, recites in part (emphasis added):

A wireless apparatus capable of supporting two types of modulation methods having different multi-value numbers, comprising:

a modulation method switching unit configured to switch, when **another wireless apparatus** to be in wireless connection with the wireless apparatus **is capable of supporting said two types of modulation methods**, the modulation method between a first modulation method having a smaller multi-value number and a second modulation method having a larger multi-value number, while the wireless apparatus is communicating with said another wireless apparatus;

a storing unit configured to store a first threshold value of a parameter indicative of communication environment of transmission path, at which the wireless apparatus can communicate with said another wireless apparatus at least by said second modulation method of said two types of modulation methods;

...

a channel allocation determining unit configured to reject, when it is determined by said parameter comparing unit that said measured parameter is lower than said stored first threshold value of the parameter, allocation of a wireless channel to said another wireless apparatus, irrespective as to whether or not communication is actually done under the second modulation method,

said storing unit further configured to store a second threshold value of a parameter indicative of communication environment of transmission path, at which the wireless apparatus can communicate with another wireless apparatus by said first modulation method, and

when there is a connection request from another wireless apparatus that supports said first modulation method but not said second modulation method to the wireless apparatus, said parameter comparing unit compares said stored second threshold value of the parameter corresponding to said first modulation method with the parameter measured by said parameter measuring unit, and when it is determined by said parameter comparing unit that said measured parameter is lower than said stored second threshold value of the parameter, said channel allocation determining unit rejects allocation of a wireless channel to said another wireless apparatus that supports said first modulation method but not said second modulation method.

Independent claims 6 and 11 recite similar features as those recited above in claim 1. Thus, independent claims 1, 6, and 11 require at least (1) *two* thresholds levels; (2) a first threshold level related to a value for communicating via the *second* modulation method (with a larger multi-value number); (3) a second threshold level related to a value for communicating via the *first* modulation method (with a smaller multi-value number); (4)

rejecting allocation from a device that supports *both* modulation methods if the measured parameter is lower than the *first* threshold level; and (5) rejecting allocation from a device that supports *only the first* modulation method if the measured parameter is lower than the *second* threshold level. As discussed below, neither Honcharenko nor Ishikawa properly disclose any of these features.

Honcharenko describes a spectrally efficient, point to multi-point communication system having one or more base stations and a number of subscriber stations. (*See, e.g.*, Abstract and col. 1, lines 6-8). At column 3, lines 35-41, Honcharenko describes the use of QPSK and QAM communication, wherein selection between these communication methods may be based on the S/I ratio. However, Honcharenko fails to describe any more details related to adaptive modulation. Thus, at best, Honcharenko broadly describes the basic concept of adaptive modulation.

In contrast, the present claims describe an *advanced* scheme of adaptive modulation wherein a determination is made regarding whether or not communication is possible without potentially degrading the communication quality. This advanced scheme involves, among other things, the use of *two* thresholds. The first threshold relates to a second modulation method with a larger multi-value number. The second threshold relates to a first modulation method with a smaller multi-value number. These two thresholds are used in rejecting allocation requests based on a measured parameter *and* based on whether the device supports one or both of the modulation methods. Honcharenko simply does not teach any of these advanced concepts.

Applicant notes that the Office Action cites column 3, lines 14-51 of Honcharenko as a basis for rejecting claims 2, 7, and 12 (now incorporated into independent claims 1, 6, and 11). However, at column 3, lines 14-51, Honcharenko merely describes different types of modulation schemes and the use of up to ten sub-carriers for uplink signals to base stations. Honcharenko does not mention anything about a second threshold related to the first modulation method (with a smaller multi-value number), much less rejecting an allocation request from a device supporting only the first modulation method based on a comparison to said second threshold.

Accordingly, for at least the above reasons, Applicant submits that Honcharenko does not teach or suggest a plurality of features required by independent claims 1, 6, and 11. Furthermore, and as discussed in more detail below, Applicant submits that Ishikawa does not cure the deficiencies associated with Honcharenko.

Ishikawa discusses a base station which manages allocation priority levels for the available radio channels according to past records of channel use for each radio channel. (*See, e.g.*, Abstract, col. 1, lines 8-12, and col. 4, lines 33-53). In particular, Ishikawa discusses that a radio allocation operations wherein “the selected radio channel is tentatively set to one of the currently unused transceivers.” (*See*, col. 9, lines 48-50). The radio channel is judged as “usable when the determined reception level is less than or equal to a prescribed threshold. (*See*, col. 9, lines 52-55). Alternatively, Ishikawa discusses that the radio channel may be judged as “usable when the determined carrier to interference power ratio is greater than or equal to a prescribed threshold.” (*See*, col. 9, lines 60-62). Thus, Ishikawa basically discusses judging if a previously set radio channel is “usable” based on the reception level as compared to a threshold, or based on the carrier to interference power ratio as compared to a threshold.

Ishikawa, however, does not teach or suggest storing two thresholds. Instead, Ishikawa only mentions a single threshold. In addition, Ishikawa makes no indication that said single threshold level is related to a value for communicating via a second modulation method with a larger multi-value number, or that the single threshold level is related to a value for communicating via the first modulation method with a smaller multi-value number. Moreover, Ishikawa certainly does not discuss rejecting allocation from a device that supports both modulation methods if the measured parameter is lower than the first threshold level. Furthermore, Ishikawa does not discuss rejecting allocation from a device that supports only the first modulation method if the measured parameter is lower the second threshold level.

Accordingly, for at least the above reasons, Applicant submits that Ishikawa also fails to teach or suggest a plurality of features required by independent claims 1, 6, and 11. As such, Applicant submits that claims 1, 6, and 11 are patentable over Honcharenko and Ishikawa. In addition, Applicant submits that dependent claims 3-5, 8-10, and 13-20 are patentable for at least the same reasons as discussed with regard to claims 1, 6, and 11.

In addition to the above, Applicant also submits that a number of the dependent claims are patentable over Honcharenko and Ishikawa for reasons in addition to those discussed above. For example, claims 3, 8, and 13 recite determining “presence/absence of any empty slot and empty channel in the wireless apparatus, and when there is no empty slot or empty channel, rejects allocation of a wireless channel regardless of the result of comparison by said parameter comparing unit.” (Emphasis added). In rejecting this claim element, the Office Action cites column 3, line 57 to column 4, line 2 of Honcharenko. This portion of text states (emphasis added):

An advantage of a multicarrier scheme according to the invention is that it allows multiple subscribers to transmit uplink data signals, simultaneously to a common base station. When a user transmits data in a non-multicarrier (i.e., single frequency channel) system, the channel is occupied for the duration of the transmission. Therefore, another user must wait for the channel to become clear before transmitting his/her own data. In the system 10, if a user requires only a low-rate uplink to send short data requests to the base station (e.g., a mouse click), only one carrier of the user's multicarrier allotment is occupied. Remaining carriers are left open thus allowing the carriers to be available for another subscriber's use.

Accordingly, the cited portion of text discusses the differences between multicarrier and non-multicarrier systems. In particular, the cited text discusses that multicarrier systems enable a channel to not be occupied for the duration of a transmission. Applicant respectfully submits that this general discussion about multicarrier and non-multicarrier systems is not the same as checking for an empty slot and an empty channel and rejecting allocation if there is no slot or channel available. At a minimum, the cited text is not related to allocation based on a determination of slots and channel availability. Thus, Applicant submits that claims 3, 8, and 13 are patentable over the cited references.

Additionally, claims 4, 9, and 14 recite notifying “another wireless apparatus requesting connection to the wireless apparatus about rejection of channel allocation, when said channel allocation determining unit rejects allocation of the wireless channel.” In rejecting these claims, the Office Action again relies on column 3, line 57 to column 4, line 2 of Honcharenko. However, as discussed above, this text merely provides a broad description

of the differences between multicarrier and non-multicarrier systems. The cited text does not mention anything about notifying the requesting apparatus if the request is rejected. As such, Applicant submits that claims 4, 9, and 14 are patentable over the cited references.

Applicant submits that these are just a few examples of why the cited art does not read on the dependent claims. However, Applicant submits that the other dependent claims are also distinguishable for their own reasons, and Applicant expressly reserves the right to address these reasons at a later time, if required.

With regard to claims 17 and 19, Applicant appreciates the indication of allowable subject matter, but submits that the independent claims from which claims 17 and 19 depend are also allowable.

Because none of the references cited by the Examiner, either separately or in combination with each other, teaches or suggests all of the features recited in independent claims 1, 6, and 11, Applicant submits that independent claims 1, 6, and 11 are patentable over these cited references. Furthermore, because dependent claims 3-5, 8-10, and 13-20 are each directly or indirectly dependent upon independent claims 1, 6, and 11, Applicant submits that each of these claims are allowable for at least the same reasons discussed above, in addition to their own reasons.

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith,

Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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